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IS 5378 (1994): Polyethylene Cane [PCD 12: Plastics]



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“Knowledge is such a treasure which cannot be stolen”

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भारतीय मानक

पॉलिएथिलीन केन — विशिष्ट

(पहला पुनरीक्षण)

Indian Standard

POLYETHYLENE CANE — SPECIFICATION

(*First Revision*)

UDC 678.742.2-418.2

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards after the draft finalized by the Plastics Sectional Committee, had been approved by the Petroleum, Coal and Related Products Division Council.

The growth of the indigenous plastics industry has resulted in the production of a number of substitutes for traditional materials. Plastics canes, or more correctly polyethylene cane, which may be produced in any desired pastel shade within permissible tolerances, is being preferred by the furniture industry as a substitute for natural cane. Polyethylene cane possessing improved strength and longer life as compared to the natural cane has almost completely replaced the imported natural cane.

This standard was first published in 1969. In this revision separate permissible tolerances for width and thickness have been stipulated for the two sizes, while the earlier version stipulated common tolerance for both sizes. Further the requirement for melt flow index has been deleted as it has been felt that if tensile strength and elongation at break is maintained as per specification, it is not essential to mention melt flow index.

It is possible to produce plastics cane from different thermoplastic raw materials which are capable of being extruded in continuous lengths. However, polyethylene cane generally produced from high density polyethylene (density not less than 0.95 g/ml) and low density polyethylene (density not less than 0.92 g/ml) containing a minimum of 70 percent high density polyethylene in the blend has been proved to be satisfactory for most applications in the furniture industry. The Committee responsible for the preparation of this standard has taken cognizance of these developments and has decided to stipulate requirements for the two types of polyethylene cane based on the current pattern of production and demand.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

POLYETHYLENE CANE — SPECIFICATION

(First Revision)

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for polyethylene cane.

2 NORMATIVE REFERENCES

The following standards contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revisions, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	Title
2530 : 1963	Methods of test for polyethylene moulding materials and polyethylene compounds
2828 : 1964	Glossary of terms used in the plastic industry
3395 : 1984	Low density polyethylene materials for moulding and extrusion
4905 : 1968	Methods for random sampling
7071 (Parts 1 to 3) : 1989	Ropes and cordages — Methods of physical test (first revision)
7328 : 1992	High density polyethylene materials for moulding and extrusion (first revision)
7703 (Part 2) : 1990	Methods of test for continuous filament polyester and polyamide flat yarn : Part 2 Tenacity and elongation at break (first revision)

3 TERMINOLOGY

[For the purpose of this standard, the definitions given in IS 2828 : 1964 shall apply.]

4 TYPES

[This standard prescribes the requirements for two types of materials, namely:

- a) *Type 1* — Produced from high density polyethylene; and
- b) *Type 2* — Produced from blends of high and low density polyethylene.

5 REQUIREMENTS

5.1 Material

5.1.1 High Density Polyethylene

High density polyethylene used for manufacturing cane shall be of grade designation PE TGN A50 T 022 or PE TGN A57 T 022 as per IS 7328 : 1992. But density, in any case, shall not be less than 0.950 g/ml and melt flow index (i_5) shall not exceed 2.0 g/10 Min.

5.1.2 Low Density Polyethylene

Low density polyethylene used for manufacturing cane shall be of grade designation LDPE 23 Y 00 or LDPE 33 Y 00 as per IS 3395 : 1984. But density, in any case shall not be less than 0.92 g/ml and melt flow index (i_5) shall not exceed 3.0 g/10 Min.

5.2 Description

The material shall be smooth and glossy, and its edges shall be free from sharp cuts. It shall not split while weaving.

5.3 Tolerance on Width and Thickness

The polyethylene cane shall be supplied in two sizes, one for seat and back and the other for border. The permissible tolerance on width and thickness for the two sizes shall be as follows:

	Width	Thickness
For the seat and back	± 0.10 mm	± 0.02 mm
For border	± 0.15 mm	± 0.03 mm

NOTES

1 The following sizes of polyethylene cane are the most suitable and are used in the furniture trade:

	Width	Thickness
For the seat and back	2.0 mm	0.40 mm
For border	3.5 mm	0.50 mm

2 The thickness may be determined by a micrometer in mm.

5.4 The material shall also comply with the requirements given in Table 1.

6 PACKING AND MARKING

6.1 Polyethylene cane shall be supplied in hank form, each hank weighing approximately 200 g with not more than 3 knots in one hank. Such one kg cane shall be packed in polyethylene bag.

Table 1 Requirements for Polyethylene Cane
(Clause 5.4)

Sl No.	Characteristics	Requirements		Method of Test (Ref to ISS)
		Type 1	Type 2	
(1)	(2)	(3)	(4)	(5)
i)	Density, g/ml, <i>Min</i>	0.950	0.940	5.1 of IS 2530 : 1963
ii)	Tensile strength at break, MPa, <i>Min</i>	300	200	IS 7703 (Part 2) : 1990
iii)	Elongation at break percent, <i>Max</i>	25	40	-do-
iv)	Denier, g, <i>Min</i>	6 000	14 000	IS 7071 (Parts 1 to 3) : 1989
v)	Colour fastness to day light	←— to pass the test —→		15 of IS 2530 : 1963

6.2 Each polyethylene bag containing cane shall be marked with the following information:

- Name and type of the material;
- Indication of the source of manufacture and trade-mark, if any;
- Mass of material;
- Size of the material;
- Date of manufacture; and
- Batch number or Code No.

6.2.1 The polyethylene cane may also be marked with the Standard Mark.

6.2.2 The use of the Standard Mark is governed by the provisions of Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

7 SAMPLING AND CRITERIA FOR CONFORMITY

7.1 Lot

In any consignment all the polyethylene cane of the same size belonging to the same batch of manufacture shall be taken to constitute a lot.

7.1.1 For ascertaining the conformity to the requirements of this specification, tests shall be carried out separately for each lot.

7.2 The number of hanks to be selected from a lot for tests to determine the conformity of the lot to the specification shall be in accordance with Table 2.

Table 2 Scale of Sampling for Polyethylene Cane
(Clause 7.2)

Number of Hanks in the Lot (1)	Number of Hanks to be Selected (2)
Up to 100	2
101 to 300	3
301 to 500	4
501 to 1 000	5
1 001 and above	6

7.2.1 Whenever possible, only one hank shall be taken from each case. However, when the number of cases in the lot is not sufficient more than one hank may be selected from a case. As far as possible the same number of hanks shall be taken from the cases opened for this purpose. The cases from a lot and hanks from a case shall be selected at random. To ensure randomness of selection random number tables may be used (see IS 4905 : 1968).

7.3 Number of Tests

Each hank selected according to 7.2 from a lot shall be separately tested for all the requirements of this standard.

7.4 Criteria for Conformity

The lot shall be declared to conform to this requirement of this specification if the test results obtained on each hanks meet the relevant requirements of this standard.

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